IN THE CLAIMS:

Please amend the claims as indicated below.

1. (Currently Amended) A method for transmitting data in a multiple antenna communication system having N transmit antennas, said method comprising the step of:

transmitting a legacy preamble and at least one additional long training symbol on each of said N transmit antennas, wherein said legacy preamble comprises at least one long training symbol, wherein a sequence of each of said long training symbols on each of said N transmit antennas are orthogonal, and wherein each of said long training symbols are time orthogonal by introducing a phase shift to each of said long training symbols relative to one another.

2. (Original) The method of claim 1, wherein said legacy preamble further comprises at least one short training symbol.

3. (Original) The method of claim 1, wherein said legacy preamble further comprises at least one SIGNAL field.

4. (Original) The method of claim 1, wherein said legacy preamble is an 802.11 a/g preamble.

5. (Cancelled)

6. (Cancelled)

7. (Currently Amended) The method of claim 1 6, wherein said phase shift is introduced to each of said long training symbols using a complex rotation.

8. (Original) The method of claim 1, wherein N is two and wherein said transmitting step further comprises the step of transmitting a legacy preamble having at least one long training symbol and one additional long training symbol on each of said two transmit antennas,

wherein one of said transmit antennas transmits one of said long training symbols with a reversed polarity.

9. (Original) The method of claim 1, whereby a lower order receiver can interpret said transmitted data.

10. (Original) The method of claim 1, further comprising the step of transmitting a field indicating said number N of transmit antennas.

11. (Original) The method of claim 1, further comprising the step of transmitting a field identifying an employed coding scheme.

12. (Original) The method of claim 1, further comprising the step of transmitting a field identifying channel bonding options.

13. (Original) The method of claim 1, further comprising the step of transmitting a field identifying a long training symbol format.

14. (Original) The method of claim 1, wherein said legacy preamble has a shorter guard interval.

15. (Original) The method of claim 1, wherein said legacy preamble has a long training field containing only one long training symbol.

16. (Currently Amended) A transmitter in a multiple antenna communication system, comprising:

N transmit antennas for transmitting a legacy preamble and at least one additional long training symbol on each of said N transmit antennas, wherein said legacy preamble comprises at least one long training symbol, wherein each of said long training symbols are orthogonal, and wherein each of said long training symbols are time orthogonal by introducing a phase shift to each of said long training symbols relative to one another.

17. (Original) The transmitter of claim 16, wherein said legacy preamble further comprises at least one short training symbol.

18. (Original) The transmitter of claim 16, wherein said legacy preamble further comprises at least one SIGNAL field.

19. (Original) The transmitter of claim 16, wherein said legacy preamble is an 802.11 a/g preamble.

20. (Cancelled)

21. (Cancelled)

22. (Currently Amended) The transmitter of claim 16 ~~21~~, wherein each of said time orthogonal long training symbols are stored in memory and said phase shift is introduced when said long training symbols are transmitted.

23. (Original) The transmitter of claim 16, wherein N is two and wherein said transmitting step further comprises the step of transmitting a legacy preamble having at least one long training symbol and one additional long training symbol on each of said two transmit antennas, wherein one of said transmit antennas transmits one of said long training symbols with a reversed polarity.

24. (Original) The transmitter of claim 16, whereby a lower order receiver can interpret said transmitted data.

25. (Original) The transmitter of claim 16, further comprising the step of transmitting a field indicating said number N of transmit antennas.

26. (Currently Amended) A method for receiving data on at least one receive antenna transmitted by a transmitter having N transmit antennas in a multiple antenna communication system, said method comprising the steps of:

receiving a legacy preamble and at least one additional long training symbol on each of said N transmit antennas, wherein said legacy preamble comprises at least one long training symbol and an indication of a duration of a transmission of said data, wherein a sequence of each of said long training symbols on each of said N transmit antennas are orthogonal, said legacy preamble transmitted such that said indication of a duration can be interpreted by a lower order receiver, and wherein each of said long training symbols are time orthogonal due to a phase shift that was introduced to each of said long training symbols relative to one another; and

deferring for said indicated duration.

27. (Original) The method of claim 26, wherein said method is performed by a SISO receiver.

28. (Original) The method of claim 26, wherein said indication is transmitted in a SIGNAL field that complies with the 802.11 a/g standards.

29. (Currently Amended) A receiver in a multiple antenna communication system having at least one transmitter having N transmit antennas, comprising:

at least one receive antenna for receiving a legacy preamble and at least one additional long training symbol on each of said N transmit antennas, wherein said legacy preamble comprises at least one long training symbol and an indication of a duration of a transmission of said data, wherein a sequence of each of said long training symbols on each of said N transmit antennas are orthogonal, said legacy preamble transmitted such that said indication of a duration can be interpreted by a lower order receiver, and wherein each of said long training symbols are time orthogonal due to a phase shift that was introduced to each of said long training symbols relative to one another; and

means for deferring for said indicated duration.